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THE STATISTICAL WORK OF THE WAR INDUSTRIES BOARD.*

By LEO WOLMAN.

Administrative statistics originate in the need of executive agencies for information upon which to base administrative decisions. Where, as in the War Industries Board, administrative functions are not at the outset well defined and clearly outlined, the statistical program for such an organization must necessarily be limited in scope and irresolute and indefinite in character. To the extent to which its problems are vague, the strength of a statistical bureau is either weakened or dissipated. The organization of statistical work is, furthermore, handicapped not only where the administrative function which it serves is not clear, but also where the executive agency occupies a double capacity, and is at once both advisory and executive. A body like the Council of National Defense, whose primary function was to lend advice and counsel to agencies which themselves made administrative decisions, has in almost every case shown itself reluctant to assume the cost involved in undertaking comprehensive and continuous statistical investigations. The division of an executive function between two agencies of this kind has the weakness which characterizes all such divisions of responsibility. Whether the advisory or the administrative agency should collect the facts must generally have been in doubt, for the results of even the joint efforts of administrator and advisor are often fragmentary and unsatisfactory. Both duplication and important omission are unavoidable in the collection of statistics when there is either uncertainty or overlapping in the function of the parent agency.

I.

Of all of the war boards established by the United States Government since April, 1917, the War Industries Board has ex-

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perienced the most radical and perhaps the most rapid changes in function and authority. Originally a part of the Council of National Defense, first as the General Munitions Board and later as the War Industries Board, its positive powers were few and consisted in the main in furnishing expert business advice to the great military purchasing agencies of the Government—the War and Navy Departments and the Emergency Fleet Corporation. With the tremendous increase in the military establishment in the late months of 1917, the continuing competition in the market between the various purchasing departments, the vast inroads upon supplies arising from purely military requirements, and the clear need for a systematic and comprehensive control of industry raised issues which could be met either by extending the authority of the War Department or by creating a supplementary agency with new and hitherto unexercised powers. The agitation in the winter of 1917–18 for the creation of a Ministry of Munitions, stripped of its possible political implications, constituted a recognition of the necessity for an organization which on the one hand would unify the activities of the many independent purchasing agencies and on the other would maintain an intelligent control over industry. Accordingly, on March 4, 1918, the President, in his letter designating Mr. Baruch as chairman of the War Industries Board, conferred upon that organization larger and clearer powers than it had possessed in the past. The adoption of the Overman Act on May 20, 1918, followed by an executive order separating the War Industries Board from the Council of National Defense on May 28, finally gave legal sanction to this delegation of authority.

As outlined by the President, the general functions of the War Industries Board were to assure an uninterrupted and adequate supply of materials for the direct and indirect military needs of this Government and of the Allies, to provide the essential civilian needs of the country, and to maintain, so far as possible, general business and industrial stability. In the performance of these functions, the War Industries Board entered into distinct and somewhat new relations with the purchasing agencies of the Government, with the public, and with industry.

(1) Little if any restriction was placed upon the power of the Government Bureaus to enter upon and to execute contracts; but the opportunities for closer coöperation with the War Industries Board were constantly extended and more and more often used.

(2) Whatever direct or indirect control over the activities of industry had in the past been exerted by the purchasing agencies fell now completely within the province of the board through its express authority, delegated to it by the President, to create new facilities, to stimulate production, to establish priorities of production and delivery, and to determine prices.

(3) Through the exercise, finally, of its powers of priority and price determination, the board was able to dictate in large measure both the character and the extent of civilian consumption and to protect the public against the rising prices that are usually the concomitants of a limited and uncertain supply of goods.

II.

Because of the close relation between the functions of the War Industries Board and those of the war and civilian purchasing bureaus of the United States Government, no satisfactory statistical program could be fashioned for either without taking into consideration the needs of both groups. Theoretically a statistical program that would meet the problems of the two groups should be easy to formulate. On the one side it is necessary to keep full and frequent statistics of supply and, on the other, complete statistics of consumption. In actual practice, however, the obstacles to this plan were serious and, in some cases, even insurmountable.

With a relatively simple material like refined copper the statistical problems were quickly solved and the results were impressive. For years before the war the United States Geological Survey had collected statistics of the annual production of copper and other metals. By prompt agreements between the producers of copper, the interested War Boards and the Survey, these annual reports were extended in September, 1917, to include weekly and monthly statistics of production and of stocks of refined copper at refineries. The War Trade Board received, similarly, current reports on stocks of copper in the

hands of consumers. From the Copper Producers' Committee weekly and monthly reports were received on the allocation of copper to the various groups of consumers. And finally, the statistical inventory was made complete by the inclusion of current data on the production and stocks of the crude material or blister. On the supply side, therefore, practically all of the information necessary for making intelligent judgments was constantly available. From week to week in 1918 it was possible to determine whether the level of production was rising or falling, whether current consumption was being met from current output or was effecting heavy drafts on stocks, whether changes in the rate of output at refineries was attributable to operating conditions at refining plants or to variations in the supply of crude materials. Here, in short, were statistics which could be made to serve as the basis of an intelligent and effective control of industry.

In other fields, unfortunately, the same experience could not be duplicated. While the statistical data on the supplies of raw materials were in most instances satisfactory, the significant gaps in information were encountered in the study of fabricated goods. The reason for this difference is clear. Among such manufactured products as optical goods, machine tools, engines, machinery, the product does not finally emerge in the form of homogeneous and relatively simple units which are susceptible of statistical tabulation. The determination of the annual domestic output of machine tools, for instance, is a task of immense detail and magnitude. Even in peace times, accordingly, statisticians depended for their indices of changes in the national product almost wholly upon the statistics of the output of raw materials. The difficulties during the war, therefore, were twofold. In the first place, the lack of past statistical material made practically impossible any comparative studies of output; and in the second place, the complexity of the material rendered impracticable an adequate survey of the field during the present. In spite of these obstacles, however, the activities of the War Boards in these fields of industrial statistics have made available for the students of economics a body of data far superior, in adequacy and accuracy, to such information as was found, for instance, in the

quinquennial reports of the Census of Manufactures. Where, furthermore, direct measures of output were unobtainable, surveys of factory capacity and of the number of wage-earners, interpreted by men familiar with industrial technic, have constituted excellent indirect measures of the size of the product.

The body of statistics relating to the consumption of raw materials in this country was even more meager than the statistics of the output of fabricated goods. Except for some scattered information in the Bureau of the Census, the Geological Survey, the Forest Service, and the Bureau of Markets, this field was barren. The urgent need for even incomplete statistics of consumption was also clear. In the case of almost every important basic material, imported or produced in this country, curtailment of consumption became, either early or late in the war, necessary. A program of curtailment presupposes a knowledge of the places in industry where economy is possible and, if possible, desirable. Such knowledge can rest only upon data which would indicate, first, the indispensable military consumption of the material and, second, the total civilian consumption, classified into consumption for various purposes and arranged in their order of importance.

During the second year of the war, for instance, a shortage of mercury was threatened. The gradual development of the shortage made necessary the curtailment of certain forms of civilian consumption of this material. The Non-Ferrous Metals Section of the War Industries Board, therefore, began the collection of figures on the military and civilian consumption of mercury. On the basis of this study it was possible to construct a table showing, first, the estimated military consumption of quicksilver in the form of mercuric fulminate and drugs and chemicals, and, second, the normal amount consumed by civilian industry in the production of such diverse products as drugs, electric batteries, dental amalgams, cosmetics, automatic sprinklers, vermilion, and felt. Once these data were available and curtailment proceeded by a progressive restriction of dispensable civilian consumption as the military requirements became larger and more pressing. The problem in this instance was a typical

one. And gradually, either by a direct circularizing of the industry or through the medium of the United States Bureau of the Census and Trade Associations, like the Rubber Association of America and the Producers of Naval Stores, a vast body of significant material on the statistics of consumption was collected.

While the gathering of the statistics of general civilian consumption fell within the province of the War Industries Board, estimates of direct and indirect military needs and consumption were contributed by the several purchasing agencies of the Government. This task was, of course, entirely new. Its successful execution depended upon the organization of a central statistical bureau in the War Department whose function it would be to standardize military requirements and to submit them to the War Industries Board in the form of frequent reports. Similar arrangements could be made with the other great purchasing bureaus. If this had been done, the War Industries Board would have had the material necessary to supplement the statistics of supply and civilian consumption. It was not, however, until the summer of 1918 that the preliminary steps for unifying requirement statistics in the War Department were taken with the institution of a statistical organization as part of the Division of Purchase, Storage, and Traffic of the General Staff. This system was a marked improvement over the old. Instead of receiving four different requirement schedules from each of the great branches of the Army, every schedule characterized by peculiarities of its own and constructed in accordance with no uniform plan or set of instructions, some standardization was finally effected. While, of course, it was impossible to combine likewise the requirement divisions of purchasing agents outside the Army, the fact that the Army was in most cases the largest single purchaser made an improvement in its statistical apparatus a material step in advance.

Many of the problems concerned with the statistics of military requirements could not, however, be solved by formal changes in the organization of the statistical branches of the purchasing bureaus. The weakness of requirement statistics to the very end was due to the failure to clarify fundamental

concepts. In reality the military consumption program of the country consisted of two elements. The first was a statement of a theoretical purchasing program, extending a year or even two in the future, and may be called the requirement program. The second consisted in a schedule of actual current contracts or purchases. The one represented roughly a projected and the other an actual consumption graph. The requirement schedules of the War and other departments were rarely of great utility, primarily because of the wide range of interpretations that were placed upon the term "requirements." A schedule of requirements for explosives, for example, was based upon the maximum attainable capacity, within a specified period, of the explosives plants of the country, irrespective, in some instances, of the availability of a sufficient supply of raw materials for the full employment of this capacity. Requirement schedules of the Signal Corps, on the other hand, rested apparently upon the needs of the Army and the quantities required were often far in excess of any present or even future visible supply. In still other cases, the requirement schedule was merely a projected contract schedule in which various modifying factors were used to allow for possible changes in the rate of purchase.

While, from its very nature, the contract or purchase schedule was a more exact piece of statistical material than the schedule of requirements, its availability and utility was also limited. In spite of frequent efforts to centralize information on war contracts, the job was never accomplished, with the inevitable result that the essential statistical combinations and comparisons could not be made. It should be noted, however, that in the construction of either a requirement or contract schedule a fundamental difficulty was always present. Both were functions of the extent of the military program. The influence upon the military program of changing political and military factors was, of course, great. There resided, consequently, in any estimate of military needs, a large element of conjecture which it was not easy to eliminate. It is reasonable to assume, however, that the institution of a planning or statistical bureau in anticipation of the war or immediately after its outbreak would have helped to avoid many of the statis-

tical pitfalls which the executive or administrative organs later met.

III.

In actual operation the statistical divisions of the War Industries Board ran the whole gamut of experiences, from periods of monotonous quiet and inaction to stages of energy and bustle. During the period preceding the separation of the War Industries Board from the Council of National Defense, the relation between the statistical division of the Council and the Board was not an intimate one. The major part of the work done by the statistical division, consisting in graphic reports to the War Department on the status of procurement, was not directly in response to the peculiar needs of the War Industries Board. Later, however, with the development of sections on the statistics of raw materials, on the organization and problems of War Industries abroad, and on Government contracts, the statistical service to the Board became more extensive. The inherent difficulty, of course, in meeting the statistical needs of the War Industries Board at this stage of its development consisted in the fact that its functions were still vague and its needs, therefore, not clear. Whatever statistical material was collected was, consequently, dictated rather by anticipated future needs than by present requests for information.

In the early spring of 1918, the first clear differentiation between the statistical work for the War Department and that for the Council and the War Industries Board was drawn when part of the organization was moved to the War Department to become the Statistics Branch of the General Staff and the other part remained as the statistical division of the Council. When the formal division of the Board from Council of National Defense took place, the statistical division became a part of the War Industries Board. Throughout this stage of transition, the many uncertainties of the situation made impossible any large development of the statistical organization. In June, however, the reorganization of statistical work with the creation of the Division of Planning and Statistics of the War Industries Board marked the beginning of a new and more fruitful stage in the statistical organization of that agency.

The unit of organization in the War Industries was the Commodity Section. The chief of each section was practically in complete control over the factors affecting the supply of the commodity or group of commodities which were under the jurisdiction of his section. The chief of the steel section, for instance, was practically the public manager of the iron and steel industry of this country. The first and most important task of the statistical division, therefore, was the organization of an adequate statistical office for each of these commodity sections. This was done by placing representatives of the Division of Planning and Statistics in practically all of the more important sections. The functions of these representatives were twofold and consisted first in making provisions for the collection and presentation of statistics to the chief of the section and, second, in submitting to the director of the Division of Planning and Statistics, current critical reports on any aspects of supply and requirements which, in the judgment of the commodity statistician, needed comment. On the basis of these statements a general report on the operations of the Board as a whole was prepared by the Statistical Division for the use of the chairman of the Board. Although this system was not in effect for a very long time, its results in the form of more extensive and more dependable information were noteworthy.

A second section of the Division of Planning and Statistics was concerned with the collection and interpretation of price statistics. Originally a part of the statistical division of the Shipping Board, its principal function had been to furnish price material to the commodity experts of that division for their use in noting the probable effects of import restrictions on prices in this country. With the transfer of the Price Section to the War Industries Board, its usefulness was extended and its program became more ambitious and elaborate. It established primarily an intimate contact with the Price-Fixing Committee of the War Industries Board by supplying to that body detailed studies on the movements of prices. Prior to this, the Price-Fixing Committee had relied for the determination of fixed prices upon the cost data of the Federal Trade Commission. With the institution of the Price Section, it

became possible for the committee to supplement the cost information with detailed inquiries into the movement of specific prices from 1913 to the current month. The economic and statistical by-product of the work of this section is to be found in the accumulation of a vast fund of price material, differing from other collections in the extent of price quotations on fabricated goods and in the possession of both quoted and contract prices.

Already the activities of the members of this section have been turned to excellent account by the issue of such bulletins as "The Movement of Prices during the Civil War and the Present War" and "The Fluctuations of Controlled and Uncontrolled Prices," in addition to many reports on price changes in the materials and products of particular industries. Comparative studies on price movements in England, France, and Italy are now in progress. Fortunately, also, the Price Section has been designated to continue its statistical analysis of the price system and contemplates the preparation within the next six months of an exhaustive history of price movements in the United States during the war.

Of the remaining sections, the Contract and Editorial, only the first was designed to make positive additions to the statistical material of the War Industries Board. As early as August, 1917, the Statistical Division of the Council of National Defense was authorized to obtain from Government contractors current reports of the progress on war contracts. A start was made on building up a contract file and schedules were currently sent to a large number of contractors. The task was, however, a formidable one and could have been properly handled only by a statistical staff as large as that of the Bureau of the Census. While the work in the contract section was not allowed to lapse completely, little attempt was made to extend its scope and the information was always too incomplete to be useful. This gap in material was serious both because of the practical impossibility of making satisfactory surveys of Government contracts during the war and because of the complete lack of data upon which, after the signing of the armistice, it was essential to base a reasonable program of contract cancellation.

The function of the Editorial Section was principally to make available to other war agencies detailed statements of the status of the supply program and of the influence upon this program of industrial conditions. Accordingly, a series of monthly commodity bulletins, covering those materials of which there was either an actual or impending shortage, were issued to more than two hundred Government officers. In addition, moreover, to these four sections, the Division of Planning and Statistics included a staff of research men who were engaged in the study of special problems for the use either of the War Industries Board or of related agencies. This group completed a series of informing studies on the effects of curtailment orders on industry, the availability of factory facilities in the United States, war-time industrial organization and problems abroad, and the consumption of materials in non-essential industries.

Although the statistical work of the War Industries Board was concerned with a distinct set of problems arising from the problems of the Board itself, opportunity for coöperation with the statistical agents of the War Boards and of the permanent departments was frequently afforded. Even before the organization of the Central Bureau of Planning and Statistics, a close informal union existed between the statistical divisions of the Shipping Board, the War Trade Board, and the War Industries Board.

As this bond was strengthened, a loose division of labor was effected in which the responsibility for statistics of imports was placed upon the Shipping Board, of exports on the War Trade Board, and of domestic industry on the War Industries Board. In some instances the joint effort was formalized by the organization of joint statistical offices, like the Joint Committee on Leather Statistics, or where the statistics branch of the Army and Navy was included, like the Joint Office on Chemical Statistics.

In the same way, coöperative arrangements made accessible to the War Industries the accumulated material of the permanent Government departments. It is, indeed, no exaggeration to state that, without the information and the advice of the technical experts of such Government agencies as the

Geological Survey, the Bureau of Mines, the Forest Service, the Bureau of Markets, and the Bureau of the Census, a large part of the fundamental factual material relating to the raw material resources of the country would never have been collected. Although unable to extend their own statistical activities because of the lack of funds and the pressure of their normal duties, these departments furnished the foundation upon which the War Boards were able to construct their statistical edifices.

IV.

The story of the organization and collection of statistics for the War Industries Board is a chronicle of substantial accomplishment in the face of serious obstacles. Whatever weakness was present in the statistical organization of the War Boards is obviously attributable not to their personnel but to their organization. It is clear, in the first place, that the collection of statistics should have been preceded by the formulation of a comprehensive plan, which would have canvassed thoroughly all possible statistical needs of a country at war and would have made provision for them. It was a mistake, further, to provide for a statistical unit which is not an integral part of the administrative body which it is designed to serve. For a long time, the statistical division of the War Industries Board was almost as foreign to that agency as were, for instance, the statistical divisions of the Shipping Board or of the War Trade Board. Intelligent collection of statistics presupposes a knowledge of problems, and such a knowledge can be obtained only if one has entry into the council of the elect. Difficulties, such as the supposed reluctance of men of affairs to receive information and advice from professional statisticians and the necessity for making decisions with such rapidity that there was no time to consult the statistics, were after all only of minor significance. What was really lacking was, first, a preliminary plan broad enough to encompass the general statistical requirements of the Government and, second, the amalgamation of the statistical bureaus with the agencies of which they were ostensibly a part.

Whatever the limitations, however, the work was for the most part well done. The scientific by-product of the work

of the Statistical Division of the War Industries is represented by a wealth of statistical material bearing on the fundamental problems of American industry. In the fields of production and price statistics, and in the data relating to the distribution and consumption of the physical product of the country, the collection is perhaps unparalleled. The files of the Division of Planning and Statistics and of the Commodity Sections of the War Industries Board may, indeed, serve as the origin for a series of studies which should for the first time combine inquiries into the nature of technologic and economic factors in industry. The immediate task for this scientific fraternity is, therefore, to provide for the preservation of the records and for their easy accessibility to the students of science.